

REMARKS

Claims 11, 24, 25, and 27-43 are pending. Claims 11, 24, 25, 27-37, and 39-42 are amended. Claims 1-10, 12-23, and 26 are cancelled without prejudice to their underlying subject matter. The specification is amended to change the stoichiometric expression in formulae disclosed therein; however, the stoichiometric ratios are not changed and no new matter is added. The IDS filed March 29, 2004, is re-submitted for consideration. All references listed therein were cited and provided in the parent case.

Claims 11, 24, 25, 27-37, and 39-42 stand objected to for informalities. These informalities have been addressed by the amendment to the specification and claims. Previously, there was some inconsistency between the stoichiometric expression of the compounds claimed and disclosed in the specification. All stoichiometric formulae have been edited to be based on a 100 numeric system, e.g., $\text{Ge}_x\text{Se}_{100-x}$, where the variable, e.g., x , is some portion of 100. The stoichiometric ratios disclosed are not changed, only their expression. For example, $\text{Ge}_x\text{Se}_{1-x}$ where x equals 0.40 is the same as $\text{Ge}_x\text{Se}_{100-x}$ where x equals 40.

Claims 11, 31, and 36 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent application 10/452,041 ("the '041 application") publication 2003/0209729 (hereinafter "Kozicki"). Applicant respectfully traverses this rejection.

Claim 11 defines a non-volatile memory cell and recites, in part, "a germanium selenide glass comprising silver, said germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein $39 \leq x \leq 42$."

Claim 31 defines a method of forming a memory cell and recites, in part, "providing a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})$, wherein $39 \leq x \leq 42$."

Claim 36 defines a method of operating a memory cell and recites, in part, "applying a voltage across a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein $39 \leq x \leq 42$."

Kozicki, at paragraphs 0051-0054, is cited as disclosing germanium selenide (i.e., $\text{Ge}_x\text{Se}_{100-x}$) glass of the recited stoichiometry. Paragraph 0054 of Kozicki states, "[a]n exemplary chalcogenide glass with dissolved metal in accordance with the present invention includes a solid solution of . . . $\text{Ge}_x\text{Se}_{1-x}\text{-Ag}$, . . . where x ranges from about 0.1 to about 0.5." However, this disclosure is not prior art to the pending claims and is not, therefore, anticipatory.

The instant application is a continuation of U.S. patent application No. 09/941,544, which was filed on August 30, 2001. The Kozicki application has an actual filing date of May 30, 2003. The Kozicki application is purportedly a divisional of U.S. patent application 09/951,882 (now U.S. Patent 6,635, 914, hereinafter "the '914 patent"), which was filed September 10, 2001, and has an identical disclosure to the Kozicki application. This effective filing date of September 10, 2001, is not sufficient to make the disclosure of Kozicki cited in the Office Action prior art to the now-pending claims. As explained below and as evidenced by the exhibits attached hereto, this September 10, 2001, filing date of the parent application is the earliest filing date to which the cited Kozicki disclosure is entitled.

Kozicki (and its parent '914 patent) lists numerous provisional patent applications and prior-filed applications (now patents) for domestic priority. None of these listed provisionals and patents disclose, teach, or suggest a memory device (or a method of forming or operating one) that comprises germanium selenide glass with a stoichiometric formula of $\text{Ge}_x\text{Se}_{100-x}$ where $39 \leq x \leq 42$ (i.e., $\text{Ge}_{39}\text{Se}_{61}$ to $\text{Ge}_{42}\text{Se}_{58}$) as recited in each of claims 11, 31, and 36. Therefore, Kozicki's disclosure in the '041 application of $\text{Ge}_x\text{Se}_{1-x}$ where x is from 0.1 to 0.5 is not enabled or supported by a written description under 35 U.S.C. § 112, first paragraph, by any of the applications or provisional applications listed in Kozicki and Kozicki is limited to the actual September 10, 2001, filing date for such a disclosure.

The first listed reference is application 09/502,915, which is now U.S. patent 6,487,106 ("the '106 patent"), filed February 11, 2000. This is attached as Exhibit A. The '106 patent does not disclose, teach, or suggest a germanium selenide glass having a stoichiometric formula of $\text{Ge}_x\text{Se}_{100-x}$ where $39 \leq x \leq 42$. At column 5, lines 36-52, the '106 patent includes a paragraph quite similar to, and likely the predecessor of, paragraph 0054 of Kozicki, which is cited in the Office Action as anticipatory of the pending claims. As can be seen, this paragraph does not include a stoichiometric range for germanium selenide as is recited by the claims now pending, in fact, this portion discloses no stoichiometric range or value. The '106 patent does disclose one specific stoichiometry for germanium selenide at column 8, line 36: $\text{Ge}_3\text{Se}_7\text{-Ag}$. This is not within the range of $\text{Ge}_x\text{Se}_{100-x}$ where $39 \leq x \leq 42$, as recited by the claims. For this reason, the Kozicki reference cannot be dated back to the filing date of the '106 patent.

Also listed by Kozicki for priority is application 09/555,612, which is now U.S. patent 6,418,049 ("the '049 patent"), filed December 4, 1998, as a PCT application. This

patent is attached as Exhibit B. As with the '106 patent, the '049 patent does not disclose $\text{Ge}_x\text{Se}_{100-x}$ where $39 \leq x \leq 42$. In fact, germanium selenide is not even disclosed as a possibility for the "ion conductor" of the invention, but instead arsenic trisulfide is the focus of the patent. Therefore, as with the '106 patent, the filing date of the '049 patent is unavailable to the Kozicki reference's disclosure of germanium selenide stoichiometric ranges as claimed.

Also listed for priority in the Kozicki reference is provisional application 60/231,343 ("the '343 provisional;" attached as Exhibit C), provisional application 60/231,345 ("the '345 provisional;" attached as Exhibit D), provisional application 60/231,350 ("the '350 provisional;" attached as Exhibit E), provisional application 60/231,427 ("the '427 provisional;" attached as Exhibit F), provisional application 60/231,346 ("the '346 provisional;" attached as Exhibit G), and provisional application 60/231,342 ("the '342 provisional;" incorrectly listed as '432; attached as Exhibit H), each filed September 8, 2000. Each of these provisional applications has the same disclosure as the '106 patent with respect to Ge_3Se_7 ; therefore, no anticipatory disclosure may be found in that portion for the reasons discussed above. None of these provisional applications may be relied on for such disclosure either.

The '343 provisional is directed to materials for electrodes and does not disclose any materials for use as a chalcogenide glass or "ion conductor," as Kozicki refers to such material. The original portion of the '345 provisional is directed to a desired glass composition for Kozicki's (the named inventor, not the cited reference) memory cells and to methods of forming such glass; however, germanium selenide is not mentioned. The '350 provisional is directed to ways of forming memory cells of chalcogenide glass such as germanium selenide, for example in a via, but discloses no

exemplary stoichiometry for germanium selenide. The '427 provisional is directed to a common electrode configuration for memory cells and does not disclose any specific chalcogenide glass types or stoichiometries. The '346 provisional is directed to a specific solution, i.e., stoichiometry, for germanium selenide glass; this glass is Ge_3Se_7 (i.e., $\text{Ge}_{30}\text{Se}_{70}$), which is not within the stoichiometric ranges recited in the claims. The '342 provisional is directed to providing a floating electrode between two memory cells and does not specify any germanium selenide stoichiometry. As is apparent from a review of each of these provisionals filed September 8, 2000, none of them can support the Kozicki disclosure of a germanium selenide $\text{Ge}_x\text{Se}_{1-x}$ range for x of 0.1 to 0.5 as expressed at paragraph 0054 of the reference. Therefore, Kozicki cannot be accorded the filing date of these provisionals.

Additionally, Kozicki lists three other provisional applications for priority purposes, but again, none of these additional three can provide the disclosure needed to accord Kozicki an earlier filing date so as to anticipate the pending claims. Provisional application 60/282,045 ("the '045 provisional;" attached as Exhibit I) was filed April 6, 2001. Provisional 60/283,591 ("the '591 provisional;" attached as Exhibit J) was filed April 13, 2001. Provisional 60/291,886 ("the '886 provisional;" attached as Exhibit K) was filed May 18, 2001. As with the provisionals discussed above, these provisionals include the disclosure from the '106 patent, but none of these provisionals disclose any germanium selenide stoichiometry falling within the claimed range.

The '045 provisional focuses on optimized electrodes for memory cells and does not disclose any germanium selenide stoichiometry. The '591 provisional is directed to an optimized glass composition for memory cells and indicates that a composition near $\text{Ge}_{20}\text{Se}_{80}$ is preferred, but a range from $\text{Ge}_{17}\text{Se}_{83}$ to $\text{Ge}_{25}\text{Se}_{75}$ is allowable.

Maria Mitkova was a listed co-inventor in the '591 provisional. She was also the author of the journal article noted in the specification of the present application at paragraph 0028; however, even with her insight, the '591 provisional fails to disclose subject matter supportive of the Kozicki disclosure so as to be anticipatory to the pending claims of the application. The '886 provisional is directed to electrodes for a memory cell and does not disclose any germanium selenide stoichiometry falling within the claimed range.

The disclosure of Kozicki cited in the Office Action was first made at the filing of the parent '914 patent, that is on September 10, 2001, which is after the effective filing date of the present application, i.e., August 30, 2001. Therefore, Kozicki's disclosure is not prior art to the presently pending claims and the 35 U.S.C. § 102(e) rejection of claims 11, 31, and 36 is respectfully requested to be withdrawn.

Claims 24, 27-30, and 32-35 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kozicki. Applicant respectfully traverse this rejection.

Claim 24 defines a memory cell and recites, in part, "a germanium selenide glass comprising silver, said germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein x is at least 40." This stoichiometric value for the germanium selenide glass begins within the range discussed above in relation to claims 11, 31, and 36. Therefore, for the same reasons, claim 24 is not anticipated by Kozicki.

Claim 27 defines a method of forming a memory cell and recites, in part, "providing a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein x is at least 39." As with claim 24, the germanium selenide stoichiometric value falls within the range recited by claims 11, 31, and 36 as discussed above and independent

claim 24 and dependent claims 28-30 are not anticipated by Kozicki for at least the same reasoning set forth above for claims 11, 31, and 36.

Claim 32 defines a method of operating a memory cell and recites, in part, "applying a voltage across a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein x is at least 39." As with claims 24 and 27, the germanium selenide stoichiometric value falls within the range recited by claims 11, 31, and 36 as discussed above and independent claim 32 and dependent claims 33-35 are not anticipated by Kozicki for at least the same reasoning set forth above for claims 11, 31, and 36.

Since the cited Kozicki disclosure is not prior art to claims 24, 27-30, and 32-35, these claims are patentable thereover. The 35 U.S.C. § 102(e) rejection of these claims is respectfully requested to be withdrawn.

Claim 25 stands rejected under 35 U.S.C. §102(e) over Kozicki. Applicant respectfully traverses this rejection.

Claim 25 defines a memory cell and recites, in part, "a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein x is about 40." This recited germanium selenide stoichiometric value falls within the range recited by claims 11, 31, and 36 as discussed above and claim 25 is therefore not anticipated by Kozicki for at least the same reasoning set forth above for claims 11, 31, and 36. Applicant respectfully requests that the 35 U.S.C. § 102(e) rejection of claim 25 be withdrawn.

Claims 37 and 39-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kozicki in view of U.S. patent 5,892,826 (Brown). Applicant respectfully traverses this rejection.

Claim 37 defines a processor system comprising an integrated circuit including a memory cell and recites, in part, "a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein x is at least 39." As with claim 24, the germanium selenide stoichiometric value recited falls within the range recited by claims 11, 31, and 36 as discussed above and independent claim 37 and dependent claims 38-41 are not anticipated or rendered obvious by Kozicki for at least the same reasoning set forth above for the patentability of claims 11, 31, and 36.

Claim 42 defines a processor system comprising an integrated circuit including a memory cell and recites, in part, "a germanium selenide glass having the formula $(\text{Ge}_x\text{Se}_{100-x})_{100-y}\text{Ag}_y$, wherein $39 \leq x \leq 42$." As with claim 24, the germanium selenide stoichiometric value is the same range recited by claims 11, 31, and 36 as discussed above and independent claim 42 and dependent claim 43 are not anticipated or rendered obvious by Kozicki for at least the same reasoning set forth above for the patentability of claims 11, 31, and 36.

Kozicki is not prior art to independent claims 37 and 42, or their respective dependent claims. Brown provides no disclosure to individually anticipate or render obvious these independent claims. Applicant respectfully request that the 35 U.S.C. § 103(a) rejection of claims 37 and 39-42 be withdrawn.

Claims 38 and 43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kozicki in view of Brown and in view of U.S. patent 6,200,870 (Yeh).

Applicant respectfully traverses this rejection. Claims 38 and 43 depend from independent claims 37 and 42, respectfully, and are patentable over Kozicki and Brown for at least the reasoning set forth above for all other claims. Yeh cannot individually anticipate or render obvious claims 38 and 43. Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection of claims 38 and 43 be withdrawn.

In view of the above, each of the presently pending claims in this application, i.e., claims 11, 24, 25, and 27-43, is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: October 13, 2004

Respectfully submitted,

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ATTACHMENTS:

Exhibits A-K.